But, indeed, as respects the controversy as to the comparative influence exercised by marine or atmospheric erosion in moulding our present land-surfaces, an equally vast lapse of time must in either case be assumed. The object of this paper is simply to suggest that the two denuding agencies have been always at work upon the surface of the earth, and that there is ample reason to consider the one to have produced effects quite as considerable as the other.

II.—Description of Part of the Lower Jaw and Teeth of a small Oolitic Mammal (*Stylodon*[1] *pusillus*, Ow.)

By Professor Owen, F.R.S., F.G.S., etc.

(PLATE X., Figs. 1, 2.)

I HAVE been favoured by the Rev. Peter B. Brodie, M.A., F.G.S., with part of the lower jaw, including eight back teeth (Pl. X., Fig. 1, natural size), of a small mammal, nearly allied to *Spalacotherium tricuspidens*, Ow., and from the same formation and locality, viz., the Marly bed Upper Oolite, Purbeck, Dorsetshire.

The part of the lower jaw is embedded in a small block of the matrix, with the outer surface exposed: it includes the proportion of the ascending ramus supporting the coronoid process, a film of which only remains in the depression of the matrix, mainly indicating its size and shape, and so much of the horizontal ramus as includes the alveoli of the nine posterior teeth, eight of which are *in situ*. The articular and angular processes, and the fore part of the ramus, have been broken away, and there is no indication in the matrix of the entire ramus having been imbedded therein; so it may be inferred, therefore, that the mutilation took place prior to imbedding. Enough, however, has been preserved to demonstrate the class-characters of the animal to which the fossil belonged, and to enable us to add another genus and species to the small category of mammalia of the Mesozoic period.

The continuous unity of bone at the part of the mandible which would show most of the sutures in a lacertian jaw—the height, breadth, and contour of the "*processus coronoideus*"—and the implantation of one, at least, of the teeth by two fangs in a double socket, concur in testifying to the warm-blooded, air-breathing, viviparous, and lactiferous class of the animal. The base of the coronoid process shows the raised boundary of the lower part of the depression for the insertion of a temporal muscle of mammalian proportions. The lower margin of the ascending ramus has a degree of thickness and

this question, which views he had previously disputed. "From the description," he says, "given by Mr. Scrope, Sir C. Lyell, Sir R. Murchison, and other competent authorities, it plainly appears that the valleys of Auvergne were excavated not at one, but at several successive periods—or, more correctly speaking, that although water was instrumental in their formation, yet that they must have been scooped out, not by any violent movement or sudden passage of a flood over the country, but *by the long-continued action of the rivers now in existence.*"

[1] στύλος, pillar; ὀδους, tooth.

flatness suggestive of marsupial affinities; but the angle itself is broken off. As, however, the alternative is the almost equally low "lessencephalous" sub-class, to which the present little insectiovore must be referred, if it be not "lyencephalous," it adds another to the prevalent testimony of the low condition of Mesozoic mammalian life.

The crowns of the teeth, encased in lustrous enamel, are long or high in proportion to their breadth and thickness. They manifest this proportion, indeed, in a higher degree than do the teeth of *Spalacotherium*, and, being rounded or cylindroid at the aspect exposed, have suggested to me the generic name *Stylodon*, signifying "pillar-tooth." The hindmost in place, supported apparently on a single columnar fang, which is partly protruded from the socket, and covered with a darker and duller cement, has a longish conical crown, with the fore part of the base rather more produced than the hind part: the crown of the next tooth is somewhat longer: that of the antepenultimate has a broader base, produced anteriorly into a minute angle, and slightly thickened behind, but not developed into a continuous cingulum. The apical half of the crown is broken off in the three teeth next in advance. Each has a small anterior basal "talon," and a single columnar root, so far as it is exposed; they are, likewise, severally smaller than the antepenultimate tooth. The seventh tooth, counting forward, is more abruptly smaller than the rest, with a simple conical crown, indicating only a feeble prominence of the fore part of the base. Then rises the crown of the largest tooth of the series, laniariform, subrecurved, or seeming to be so, from the convexity of the front border, and the minor concavity of the hind one, where the base is a little thickened and produced,—this crown is supported on two divergent fangs. The convex surface of the jaw beneath these teeth is entire—shows no neurovascular outlets—the main anterior one has gone with the missing fore part of the ramus.

Any attempt to determine the nature of the above described eight teeth, in the absence of information as to their relations to deciduous teeth, must be made on unsatisfactory and uncertain grounds. Guided by their shape and proportions, we might view the foremost as a "canine," the next four as "pre-molars," the last three as "true molars," and thus infer an example of placental diphyodont dentition. The objection to the two-fanged character of the canine would be met by the same mode of implantation of the canine of the common mole (*Talpa*), the proportion of which tooth to the succeeding premolar is very similar to that presented by *Stylodon*.

But the proportion of the preserved dentigerous part of the present fossil to the part behind indicates a greater number and size of teeth in advance of the laniariform tooth than the three small incisors of *Talpa*. The closer similarity of the narrow columnar hinder molars to those in the Cape mole (*Chrysochloris*, Cuv.), and the very probable addition of an eighth such molar to the seven in place behind the laniariform tooth of the fossil, warn us of the deceptive character of the analogy of the dentition of the common mole. It is

more likely that *Stylodon*, like *Spalacotherium*, and *Chrysochloris* (unique in this respect among existing *Insectivora*), exemplified that excess of number of teeth, which, in *Marsupialia*, as in *Insectivora*, is seen in a single known existing genus (*Myrmecobius*), but was common in the similar small insectivorous pouched mammals of the older Oolitic deposits. *Spalacotherium* had ten molar teeth on each side of the lower jaw, of which the last six had tricuspid crowns, with proportions and spacing similar to those in the Cape mole.[1] The corresponding teeth of the present genus and species are in closer contact with each other, and are of more simple shape, and apparently more simple implantation.

The grounds for adding another genus and species to the Purbeck Mammalian catalogue (*Spalacotherium, Triconodon, Plagiaulax*) are sufficient, and also, as it seems to me, to determine the genus to have been either less- or ly- encephalous; but, with the known range of diversities of dental character in recent and extinct marsupial and placental *Insectivora*, I feel a need of further evidence before pronouncing on the sub-class or order of *Stylodon*.

EXPLANATION OF PLATE X.

Fig. 1.—Portion of lower jaw and teeth of *Stylodon pusillus*, Ow., as embedded in the matrix, nat. size.

Fig. 2.—The portion of jaw and eight teeth in place, magnified three times.

III.—On the Occurrence of a Recent Species of *Trigonia* (*T. Lamarckii*) in Tertiary Deposits in Australia.

By H. M. Jenkins, F.G.S.

(PLATE X., Figs. 3–7.)

In No. VI. of the "Quarterly Journal of Science" I gave a brief account of the *Trigonia semiundulata*, M'Coy, MS., which has been found in certain Tertiary strata in the Colonies of Victoria and South Australia, and which had been named, but not described, by Professor M'Coy. This species differs altogether from the recent forms, and approaches very closely in its essential characters to the members of the group "costata," characteristic of the Oolites. It was therefore remarked, in the communication referred to, that its occurrence in Tertiary strata in Australia added another link to the chain of evidence which connects the recent fauna of that region with the Oolitic fauna of Europe. But doubt may be expressed as to the exact value to be assigned to this similarity in facies between two faunæ so widely separated in time; and it is a fair question whether the discovery of this *Trigonia* does not diminish, rather than add to the apparent peculiarity of the existing Australian fauna.

Having recently received a large collection of fossils from the Tertiary strata of Victoria, and the specimens having been collected and labelled by the officers of the Geological Survey of the colony,

[1] Proceedings of the Geological Society of London, June 1854, p. 425.